

Date: Tue, 14 Sep 93 04:30:36 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #43
To: Ham-Homebrew

Ham-Homebrew Digest Tue, 14 Sep 93 Volume 93 : Issue 43

Today's Topics:

 311-A/B vaccuum tube info wanted.please?
 Finding Motorola SMT in small quantity
 LO isolation in upconverting rcvr
 Morse Keyboard replacement
 NASA select rcvr
 NASA Select RX

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Sun, 12 Sep 93 10:08:52 PDT
From: library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!nntp.cs.ubc.ca!
malin1.mala.bc.ca!oneb!ham!emd@network.ucsd.edu
Subject: 311-A/B vaccuum tube info wanted.please?
To: ham-homebrew@ucsd.edu

randy@cyphyn.UUCP (Randy) writes:

> Thanks for the info...here's what I've done so far:
>
> Using a VOM I checked the fil. Shows very much like a 24A fil.... 0.7 ohm
> and a 24A wants 2.5 volts.
>
> If this 311A didn't have the closed off ends of the Kathode, I could just
> apply all the different standard voltages...1.25 1.4 2.0 2.5 2.8 5.0
> 6.3 etc etc.....we can omit 1.4 2.0 2.8, as those are for the low current
> filamentary tubes (1U4 1AH5 3S4 , #30 #31 #32 etc) ...leaving 2.5 5 6.3

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> volts.
> I'd apply power and watch the heater and see if it glows the right
> amount ( orange ).... that then would be the proper volts.
>
> BUT...I can't see the fil! They have it covered by a ceramic bead on the bot
> and something (?) over the top.
>
> I'll have to get my tube tester back from where it's being borrowed, and 1st
> start at 2.5 v .... using a 24A setup, and see how it conducts... if bad,
> then try 5....then 6 then 12 then ( grit my teeth ) 24 ... until
> I see the cathode itself glow dull red-orange ( hard to see INSIDE as well)
> or the tube indicates plate current...
>
> The end result is to be, to use it like a 24A...a 1 tube regenerating
> detector... like the 'Thrill Box' ( it sure WOULD be if the earphones
> had a short from coil to case! ) of the 30's.
>
> ( Mean while, I'm making a 1 tube #26 transmitter...xtal controlled, good
> for at least 100 mw ... I only await arrival of xtals and xtal socket )
>
>
> --
> Randy KA1UNW If you get a shock while "Works for me!"
> servicing your equipment, -Peter Keyes
> randy@192.153.4.200 DON'T JUMP!
> You might break an expensive tube!

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My 1967 ARRL Handbook lists the 211 and 311 together on the same line, and gives specs for almost everything EXCEPT filament voltage.

My old RCA Transmitter Tubes manual, however, lists the 211 as a discontinued tube (in 1962). It does say the 211's filament voltage is 10 volts, ac or dc, and 3.25 amps current.

If you need more information, I suggest you look for a '40's or 50's transmitting tube manual.

73, Bob.

Robert Smits
VE7EMD
Ladysmith B.C.
e-mail: emd@ham.almanac.bc.ca

There is *no* idiotproof filter.
Idiots are proof against anything!
- Richard Chycoski, VE7CVS

Date: 13 Sep 93 19:45:16 GMT
From: ogicse!hp-cv!sdd.hp.com!hpscit.sc.hp.com!rkarlqu@network.ucsd.edu
Subject: Finding Motorola SMT in small quantity
To: ham-homebrew@ucsd.edu

In article <26t03s\$716@newsserv.cs.sunysb.edu>,
Rick Spanbauer <rick@cs.sunysb.edu> wrote:
>Designing and building RF circuits is certainly a lot of fun, but it
>borders on the impossible to get modern parts in small quantity! Does
>anyone know of a source for small quantities of the Motorola MMBR901L
>(SMT version of the MRF901)? Active seems to carry some reasonable
>second choices to the MMBR901L, eg MMBR9411, but they say Moto will
>not let them break a rail to sell part in small quantity. Should I
>starting thinking Philips, Siemens, Mitsubishi (off shore) for RF
>parts, or is there a way to get Motorola in small quantities? I
>want to stay with SMT, since it is a bit of a drag to have to drill
>all the holes needed for through-hole when using home grown PCBs :-)
>
>BTW, anyone know whether the 2N4416(A) is available in SMT?
>
>Rick Spanbauer, WB2CFV
>State U of NY/Stony Brook

Unfortunately, there is no easy answer to this. Even with working
at HP (a supposedly "key account") and wanting to order 100 parts
for production, it is very tough to deal with Motorola. However,
Philips, Siemens and Mitsubishi are even harder to deal with.

As I have said before, if HP is using the part (and we do use
MRF9411's which are 4-leaded MMBR941s), you can order as few as
1 of them as a replacement part from HP's service center. I'll
apologize in advance for the huge markup compared to Motorola's
price list. Another approach is to see if Motorola's cellular
phone division, etc. uses the part and order it as a replacement
part from them. They might only mark it up half as much as HP.

Rick Karlquist
HP Santa Clara Division
rkarlqu@scd.hp.com

Date: 13 Sep 93 19:53:22 GMT
From: ogicse!uwm.edu!vixen.cso.uiuc.edu!sdd.hp.com!hpscit.sc.hp.com!
rkarlqu@network.ucsd.edu
Subject: LO isolation in upconverting rcvr
To: ham-homebrew@ucsd.edu

In article <270im3\$mo1@newsserv.cs.sunysb.edu>,

Rick Spanbauer <rick@cs.sunysb.edu> wrote:

>I am working on a design for a broadband up converting receiver architecture.
>For a while I had myself convinced that I could live without tracking frontend
>filters, at least until it became clear that LO leakage would be a
>problem. As is standard practice these days, I have a fairly strong first
>mixer specified, ie LO at about 13 dbm. The standard MCL mixers will give
>about 25 dB or so LO-> RF suppression and coupled with the first RF amp,
>I can see my way clear to about 35-40 dB total isolation which would
>put the LO leakage at the antenna connector at $13-40 = -27$ dbm (too much).
>The LO is currently specified to produce $RF+LO \Rightarrow IF$, which puts its
>signal within the LPF passband in the frontend. I gather from looking
>at some existing designs that other designers setup their up converting
>designs to work as $LO-RF = IF$, which puts the LO signal well above the LPF
>passband. Here is the hitch: since the rcvr I am working on will operate
>50 - 1000 MHz, with about 1200 MHz IF, my LO would have to cover
>1250-2200 MHz which is pushing it a bit for a reasonable PLL design (eg
>prescaler availability). So it would seem that my options are to either
>split my coverage into a couple of bands and downconvert, or come up with a
>way of getting some more S12 in the frontend networks. My frontend amp is
>currently a MMIC, which has fairly rotten S12. A fet might get me further,
>though I would probably have to breakup the frontend into octave wide
>filter+amp combos to keep the gain managable as $f \rightarrow 0$. Advice anyone?

>

> Rick Spanbauer, SUNY/Stony Brook

An $RF+LO = IF$ scheme has a lot of problems besides antenna radiation.

What do you do when you want to receive 600 MHz? $RF=LO=600$ MHz. = $1/2$ IF.

Similar problems occur at 300, 400, and 800 MHz. Now you can see
why no one does it that way.

Rick N6RK

rkarlqu@scd.hp.com

Date: Tue, 14 Sep 1993 02:06:04 GMT

From: library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!usc!

sdd.hp.com!hpscit.sc.hp.com!hplextra!opus!walker@network.ucsd.edu

Subject: Morse Keyboard replacement

To: ham-homebrew@ucsd.edu

In rec.radio.amateur.homebrew, byon@beach.csulb.edu (Byon Garrabrant) writes:

> In regards to the software, I put a lot of energy writing a morse-code
> decoder algorithm to decode even the sloppiest of fists. It does a real
> good job too.

> ...

> I experimented with several designs for handling the changing WPM rate,
> and settled on a rather simple scheme which only needed to keep track
> on the length of the last mark. I'd be glad to go further into it.

Byon,

Please elaborate. This is exactly the kind of practical algorithm that
I wanted to hear about!

--

Rick

Date: Mon, 13 Sep 1993 18:23:44 GMT
From: nwnexus!ole!ssc!markz@uunet.uu.net
Subject: NASA select rcvr
To: ham-homebrew@ucsd.edu

arthur blair (blair@mksol.dseg.ti.com) wrote:

First, a note. There is a project for a satellite receiver in
the January 1986 Radio-Electronics magazine. It uses the old
70 MHz LNA system. It also uses an SAW filter (which may be
real hard to get) and an ECL gate as the IF amplifier.

: The IF output. Particularly demodulation. God but I dread the
: notion of buying a TV! It may sound silly (OK it probably
: does sound silly) but it's against my philosophy to even
: own one, much less turn it on. Are chips readily available
: to roll your own TV tuner? A single frequency unit ought to be
: simple enough. I dont want it to even LOOK like a TV.

Since the modulation for satellite signals is so different from
terrestrial tv (a 20 MHz wide FM signal with audio subcarriers in
the 5.5 to 8 MHz range), a satellite receiver has to demodulate down
to baseband. If you want a RF TV signal you have to create it
with a modulator. Which will usually causes some loss of signal
quality. So most every satellite reciever has baseband video and
audio outputs. A friend of mine uses the monitor from his old
Zenith Z100 computer, and runs the sound through his stereo.

: By the way. It sounds like the LNB's are pretty much self contained.
: What are those control (?) boxes they sell with them that sit on the
: TV inside. If the LO is fixed frequency, what more is there to do
: but turn it on and off?

:
: Does the IF bandwidth of the LNB occupy the entire UHF band?
: Do LNB's usually come with the feedhorns attached?

The input to the receiver is the entire 950 - 1450 MHz band with all the signals (with the proper polarization) at once. The receiver has a tuner module with a PLL synthesizer. An outfit advertises tuner modules in Nuts and Volts magazine and probably in the other electronics classified ad sections like that comes every couple of months in Electronics Now (formerly Radio-Electronics).

: If LNB's are so cheap why do new TVRO systems cost so much?
: Where's the expensive part?

The dish, the descrambler, and the heaps of manure sitting around the salesman's feet.

Mark Zenier markz@ssc.wa.com markz@ssc.com

Date: 11 Sep 93 16:13:35 EDT
From: psinntp!arrl.org@uunet.uu.net
Subject: NASA Select RX
To: ham-homebrew@ucsd.edu

Greetings!

I don't know why you'd want to bother with building a sat RX-- you can go to your local Sat dealer and buy an old, obsolete one for \$10-\$20.

For one channel (or one satellite) they'll work fine.

Old LNAs, LNBs, etc, and give-away cheap. So are old 10-foot dishes.

I build lots'a stuff, but old sat hardware is often free, so I wouldn't bother.

Try this classified and you'll be sure to get an entire system:

RADIO EXPERIMENTER seeking hardware will remove that unsightly satellite dish and equipment from your property FREE! Call....

It works!

--Kirk, NT0Z

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=====
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=====
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Date: 13 Sep 93 15:06:34 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!noc.near.net!
transfer.stratus.com!jjmhome!pig!die@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <1993Sep9.054942.11654@mksol.dseg.ti.com>, <1211@pig.UUCP>,
<1993Sep11.025426.1880@mksol.dseg.ti.com>.st
Reply-To : jjmhome!pig!die@transfer.stratus.com
Subject : Re: NASA select rcvr

In article <1993Sep11.025426.1880@mksol.dseg.ti.com> blair@mksol.dseg.ti.com
(arthur blair) writes:
>2 problems remain...
>The antenna. What is the typical gain of a 6-7 foot dish?

At C band around 39 db.

>think I could get by with a horn? Assuming I could keep the
>birds from nesting in it, it would be easier to mount on the
>chimney and less intrusive.

I have used a horn experimentally many years ago, but it was
pretty large and only barely adequate. You do get better aperture
efficiency with a horn but even so you are going to need a pretty
big one because the difference is only about 4-5 db.

>The IF output. Particularly demodulation.

Most satellite receivers deliver RS-170 style video outputs as
well as modulated rf. If you have a board for your PC that takes NTSC video as
input you should be just fine. All current satellite video (prior to
the Digicipher) is NTSC composite with the color information riding on
the chroma subcarrier so you will need to use something that can do
NTSC to rgb conversion. There are several commercial products available
today that will do this as part of a multimedia PC environment and dump
the video into memory via DMA.

Audio is direct RCA plug out on a satellite receiver (except commercial units which usually are balanced 600 ohm). So all you will need is a stereo.

> God but I dread the
> notion of buying a TV! It may sound silly (OK it probably
> does sound silly) but it's against my philosophy to even
> own one, much less turn it on.

I grew up in a house without a TV until I found one on the town dump and fixed it up (I was age 11). I strongly support your views on the idiot box, but my wife is a TV addict and so I have vastly too many of them. I make up for my hatred of the content by trying for the best picture possible. And satellite newsfeeds are very addictive.

> Are chips readily available
> to roll your own TV tuner? A single frequency unit ought to be
> simple enough. I don't want it to even LOOK like a TV.
>

Actually, you could probably find the whole tuner. They are a standard item made for cable boxes and TVs in the far east.

> By the way. It sounds like the LNB's are pretty much self contained.

Yes they take +18 volts and deliver 950-1450 mhz over the same 75 ohm coax. No adjustments needed. All TVRO units use waveguide input and coax output.

> What are those control (?) boxes they sell with them that sit on the
> TV inside.

They are the tuner for the second IF that tunes a 10 mhz deviation FM TV signal anywhere from 950-1450 mhz and demodulates it to video and audio. Most of those boxes also include antenna positioning controllers and power supplies and a descrambler for the pay services. No TV understands wideband dithered FM TV signals with FM sound subcarriers at 6.8 mhz - it takes the receiver box to convert this to something the TV can deal with.

If the LO is fixed frequency, what more is there to do
> but turn it on and off?

The first LO is a fixed frequency, but TVRO receivers are usually double or more often triple conversion. The second LO is usually frequency agile and synthesised to allow tuning of the 24 different transponders on a satellite.

>

>Does the IF bandwidth of the LNB occupy the entire UHF band?

LNBs usually output at 950-1450. When I mentioned tv tuner technology I was refering to a varactor tuned converter design such as used in TV tuners rather than literally a TV tuner. But some very early block conversion systems did use UHF TV frequencies, leakage from UHF TV stations forced the move to 950-1450.

>Do LNB's usually come with the feedhorns attached?
>

No the feedhorn is normally a separate component that bolts to a waveguide flange on the LNB. There have been a few recent integrated feed/LNB designs made but they are not yet common.

>If LNB's are so cheap why do new TVRO systems cost so much?

The receivers/descramblers are complex devices with lots of stuff in them. And dishes contain significant metal and metal fabrication costs. And antenna positioners and feed covers and all the other parts cost money to make too. And TVRO systems are not sold in titantic volumes by aggresive discounters which means that margins are high.

>Where's the expensive part?

GI gets about \$300 for the descrambler module. A 10 foot dish and a mount costs about \$300 to make. And you can buy the parts of a complete new system for as little as \$500.

>Art.

David I. Emery - N1PRE - Lexington Mass.

Former senior technical consultant (and currently unemployed drunken bum)
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End of Ham-Homebrew Digest V93 #43
